3/9/6 (Item 3 from file: 144)
DIALOG(R)File 144:Pascal

12722296 PASCAL Number: 96-0429765
Umfangskraftverhalten von Pkw-Reifen bei unterschiedlichen Fahrbahnzustaenden
(Longitudinal force behaviour of passenger car tyres at different road conditions)
GNADLER R; %UNRAU H J%; FISCHLEIN H; FREY M
Ahornstrasse 23, 75217 Birkenfeld, Germany; Zipser Strasse 5, 76227 Karlsruhe, Germany; Morgenstrasse 17, 76137 Karlsruhe, Germany; Stuttgarter Strasse 7, 76337 Waldbronn, Germany
Journal: ATZ. Automobiltechnische Zeitschrift, 1996, 98 (9) 458-466 (8 p.)
ISSN: 0001-2785 CODEN: AUTZA6 Availability: INIST-326; 354000066166510110
Number of Refs.: 7 reference
Document Type: P (Serial) ; A (Analytic)
Country of Publication: Germany
Language: German Summary Language: English
In the context of a research project initiated by the Forschungsgemeinschaft Automobiltechnik e. V (FAT) longitudinal force-slip-curves for six representative tyre types were measured for different road surface conditions (dry, humid, wet, icy) at the inside drum tyre testing device of the University of Karlsruhe (TH), where real asphalt surface elements are being used and defined surface conditions, such as water depth and ice temperature, can be produced. With the help of this project a kind of catalogue could be established, which summarizes the parameter influence on the longitudinal force behaviour of representative tyres. For dry surfaces, the velocity has little impact on the initial gradient of the curves, but influences the maximum value and the curve for larger slip values, as can be seen in fig. 4. A lower tread depth leads to an increase in the gradient (fig. 5) and snow tyres show a significantly lower gradient than summer tyres (fig. 7). When going from a dry to a humid surface, it can be noted that the maximum longitudinal force coefficient decreases significantly (fig. 9), while the initial gradient only decreases for large velocities and water depths. For icy surface it was found that the maximum longitudinal force coefficient and the form of the curves depend largely on the velocity and the temperature (fig. 11 and 12). New insights were found on the influence of the skid resistance at wet and humid surface on the longitudinal force behaviour (fig. 8), even though further research on this aspect will be necessary.

English Descriptors: Motor industry; Vehicle dynamics; Tyre; Pavement; Experimental study; Testing equipment; Test bench
French Descriptors: Construction automobile; Dynamique vehicule; Pneumatique; Chaussee; Etude experimentale; Appareillage essai; Banc essai

4/9/8 (Item 1 from file: 6)
DIALOG(R)File 6:NTIS

1939208 NTIS Accession Number: TIB/A96-00501
Ermittlung von mu -Schlupf-Kurven an Pkw-Reifen. (Determination of mu -slip curves on automobile tyres)
Gnadler, R. ; %Unrau, H.J. %; Fischlein, H. ; Frey, M.
Forschungsvereinigung Automobiltechnik e.V., Frankfurt am Main (Germany, F.R.).
Corp. Source Codes: 082906000; 9900053
Jan 95 175p
Languages: German
Journal Announcement: GRAI9609
In German. FAT-Schriftenreihe, v. 119.
Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC E14
Country of Publication: Germany, Federal Republic of
mu -slip curves for six representative types of car tyres and different states of carriageway (dry, damp, wet, icy) have been determined on a test stand as a function of car velocity, and the influence of tyre pressure, tyre load, profile height and slip angle on the curves has been investigated. Results are compiled to be used as a catalogue. On icy carriageways maximum values and curve shapes largely depend on temperature and car velocity. Differences in the mu -slip curves of different types of tyres are much more pronounced on damp roads than on dry roads. (WEN). (Copyright (c) 1996 by FIZ. Citation number 96:000501.)
Descriptors: *Measurement; *Slip; *Tires; *Automobiles; Test facilities; Measuring instruments; Wheels; Weather
Identifiers: *Foreign technology; NTISTFFIZ
Section Headings: 85H (Transportation--Road Transportation); 94K (Industrial and Mechanical Engineering--Laboratory and Test Facility Design and Operation)

7/9/1 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

04606505 Genuine Article#: TW249 Number of References: 10
Title: VERTICAL LOAD-DEFLECTION BEHAVIOR OF A PNEUMATIC TIRE SUBJECTED TO SLIP AND CAMBER ANGLES
Author(s): WANG YQ; %GNADLER R%; SCHIESCHKE R
Corporate Source: UNITED PARTS AUTOMOT ENGN GMBH/DASSEL//GERMANY/
Journal: VEHICLE SYSTEM DYNAMICS, 1996, V25, N2 (FEB), P137-146
ISSN: 0042-3114
Language: ENGLISH Document Type: ARTICLE
Geographic Location: GERMANY
Subfile: SciSearch; CC ENGI--Current Contents, Engineering, Technology & Applied Sciences
Journal Subject Category: ENGINEERING, MECHANICAL
Abstract: In this paper the vertical load-deflection behaviour of a pneumatic tire has been studied theoretically. A simple mathematical model which is especially suitable for a tire applied by a side force has been developed. Researches carried out in the past show that the tire vertical stiffness varies neither proportionally nor symmetrically as the slip angle of a cambered tire is changed. This effect can be explained by the theory developed here.

The model predictions have been verified using experimental results obtained from literature. Moreover, tire cornering characteristic curves obtained under different test conditions, i. e. during increasing of the slip angle the vertical load is kept constant or not, have been discussed through a simulation example. This study shows that the characteristic curves vary rather considerably under the different conditions.
Cited References:

10/9/1   (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

13173433   PASCAL Number: 97-0435716

Methodologie de validation du logiciel de dynamique automobile CALLAS : Dynamique du vehicule automobile et ferroviaire

(Software validation methodology of automotive dynamics CALLAS)

LECHNER D; DELANNE Y; SCHAEFER G; SCHMITT V

INRETS Departement Mecanismes d'Accidents, Unknown; LCPC Section Interaction Route/Vehicule & Acoustique Routiere, Unknown; SERA-CE (Societe d'Etudes et Realisations Automobiles), Unknown; DGA-ETAS Departement Performance en Mobilite des Systemes, Unknown

Congres SIA, 7 1997-04-09

Journal: Ingenieurs de l'automobile : (Paris), 1997 (713) 42-48

ISSN: 0020-1200 CODEN: IAUTA9 Availability: INIST-276; 354000068178460010

Number of Refs.: 6 reference

Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)

Country of Publication: France

Language: French   Summary Language: English

This paper presents the work carrier out by INRETS and LCPC with SERA-CD, to validat the road vehicle dynamic package called CALLAS, developed by SERA. This program benefited from important contributions from ETAS and PSA, for track tests and Michelin for tire modeling. Track tests were carried out with 4 very differents cars, fitted with full data collection systems, on dry and wet roads. The overall vehicle operating area was covered: pure lateral and longitudinal dynamics and various combinations of these, from low solicitation up to and beyond the %limit% of %adhesion%. The %simulation% results are in general satisfactory, they reveal the large influence of %tire% %characteristics% and car of parameters on the precision obtained.

English Descriptors: Automobiles; Vehicle dynamics; Computer software; Dynamic model; Three dimensional model; Non linear effect; Numerical simulation; Adhesion; Braking; Tires

French Descriptors: Automobile; Dynamique vehicule; Logiciel; Modele dynamique; Modele 3 dimensions; Effet non lineaire; Simulation numerique; Adherence; Freinage; Pneumatique

10/9/2 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

02262754 E.I. Monthly No: EIM8707-049875
Title: INVESTIGATION INTO THE EFFECTS OF SUSPENSION DESIGN ON STABILITY OF LIGHT VEHICLES.
Author: Nalecz, Andrzej G.
Corporate Source: Univ of Missouri-Columbia, USA
Conference Title: Automotive Crash Avoidance Research. (Papers Presented at the SAE International Congress and Exposition.)
Conference Location: Detroit, MI, USA Conference Date: 19870223
Sponsor: SAE, Warrendale, PA, USA
E.I. Conference Number: 09802
Source: SAE Special Publications SP-699. Publ by SAE, Warrendale, PA, USA p 87-120
Publication Year: 1987
CODEN: SAESA2 ISSN: 0099-5908 ISBN: 0-89883-970-X
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8707
Abstract: A variety of suspension are used in light vehicles and they affect dynamics of vehicles in various ways. The components of lateral and longitudinal weight transfers, which depend upon suspension design, influence the wheel normal loads, %tire% %characteristics%, and %tire% -roadway %limits% of %adhesion% which in consequence %determine% vehicle stability. %Modeling% procedures for nonlinear kinematic and dynamic analysis of 25 commonly used light vehicle suspensions have been developed and applied to investigate the spatial movement of vehicle roll axis. A nonlinear tire model based on a friction ellipse concept and capable of accepting CALSPAN tire data has been developed to compute cornering forces as functions of slip angle variables, normal loads, %tire% adhesion %characteristics% and skid numbers. (Edited author abstract) 47 refs.
Descriptors: *VEHICLES--*Springs and Suspensions; EQUATIONS OF MOTION
Identifiers: SUSPENSION DESIGN; NONLINEAR TIRE MODEL; VEHICLE MOTION MODELING; FRICTION ELLIPSE CONCEPT; SUSPENSION KINEMATIC ANALYSIS; DYNAMIC ANALYSIS
Classification Codes:
432 (Highway Transportation); 661 (Automotive Engines & Related Equipment); 931 (Applied Physics)
43 (TRANSPORTATION); 66 (AUTOMOTIVE ENGINEERING); 93 (ENGINEERING

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N4            324   154: MEDLINE(R)_1990-2004/Jul W3
N5            318   144: Pascal_1973-2004/Jul W2
N6            282     5: Biosis Previews(R)_1969-2004/Jul W3
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N8            211   148: Gale Group Trade & Industry DB_1976-2004/Jul 23
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N18            52    35: Dissertation Abs Online_1861-2004/May
N19            47   621: Gale Group New Prod.Annou.(R)_1985-2004/Jul 23
N20            45   160: Gale Group PROMT(R)_1972-1989
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S4           8   E4-E7
S5          22   E3-E6
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S7          16   S5 NOT (S3 OR S4)
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10/9/8 (Item 5 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05902219 SUPPLIER NUMBER: 12381465 (THIS IS THE FULL TEXT)
LVDS investigates vehicle in a variety of maneuvers. (Light Vehicle Dynamics Simulation) (Computers in Engineering)
Trego, Linda E.
Automotive Engineering, v100, n4, p35(2)
April, 1992
ISSN: 0098-2571 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 1311 LINE COUNT: 00111

TEXT:

In the past several years, much attention has been given to predicting the directional response of light vehicles to various driving conditions, including emergency situations. The stability and handling of vehicles, over the full maneuvering range from straight running to limit cornering and braking, has been a subject of much study. The current research trends reflect the need for a useful vehicle dynamics simulation that can be run on a PC.

Most existing general purpose vehicle simulation software has been developed for specific vehicle design tasks and is not suitable for qualitative analysis of vehicle active safety problems. The development of vehicle models using general-purpose simulation software is very time-consuming and requires a high level of expertise. Furthermore, the majority of this software is not capable of incorporating more advanced pneumatic-wheel models which utilize multi-directional tire deformation states and nonholonomic constraint formulations without a major reorganization of the entire software.

A variety of suspensions are used in light vehicles, and they affect dynamics of vehicles in various ways. The components of lateral and longitudinal weight transfers, which depend upon suspension design, influence the wheel normal loads, %tire% %characteristics%, and %tire% -roadway %limits% of %adhesion% that ultimately %determine% vehicle stability. The key to a successful %simulation% is to ensure that the sensitive area is modeled with sufficient flexibility to enable the envisaged design situations to be encountered. Among all of its elements, the design of suspension systems and the pneumatic tires have a significant influence on the dynamic performance of light vehicles.

The LVDS (Light Vehicle Dynamics Simulation) program for the personal computer, developed by Vehicle Dynamics Inter-national, is a result of research in vehicle dynamics and tire modeling. The LVDS simulation is a package of PC-based programs developed to investigate the complex dynamic responses of light vehicles in a variety of maneuvers. These maneuvers include cornering with braking or acceleration as well as vehicle skidding, spinning, or rolling over. The software allows the engineer to research the propensity of vehicles to lose control and to investigate the influence of vehicle and/or subsystem design characteristics on performance, handling, stability, and rollover behavior.

The LVDS utilizes state-of-the-art techniques in modeling tire behavior, tire-roadway interaction, suspension effects, steering control systems, and vehicle aerodynamics. This makes it possible to investigate complex dynamic responses of light vehicles in a variety of maneuvers including critical accident situations - and to test, retest, and analyze the performance of vehicles in a fraction of the normal time. Because of this, the LVDS greatly reduces time, expense, and effort required for new product research. The program aids in determining the initial conditions and/or operational and run-time parameters for input into complex mainframe simulations.

The LVDS program is also beneficial for engineers involved in the design of vehicle subsystems including suspensions, tires, wheels, steering, drives, and braking systems. By using the simulation, these

engineers can investigate the effects of any proposed changes in subsystems on the dynamic behavior of the complete vehicle dynamic system.

Prior to a simulation, a 3-D nonlinear vehicle model of intermediate detail is generated according to user specifications. Multiple model masses are connected through suspension elements to account properly for vehicle forward, lateral, vertical, roll, and directional dynamics. To build an accurate vehicle model, the eight different, commonly used types of front suspension systems can be employed in conjunction with any one of 19 different rear independent, semi-independent, and dependent suspension systems. By deciding on the suspension types and entering the vehicle data such as mass-inertia, geometry, stiffness, damping, compliance, drive type, brake distribution factors, type of steering control system, aerodynamics, and %tire% and roadway %characteristics%, engineers can create their own vehicle data files.

In each simulated vehicle maneuver, over 70 major dynamic and handling characteristics such as positions, velocities, accelerations, roll centers, weight transfers, and tire forces generated are determined.

Through a combination of the steering and braking/thrust inputs any single and combined, cornering and braking or accelerating, sub-%limit% or %limit% (at the tire-roadway %limits% of %adhesion%) maneuvers as well as vehicle skidding, spinning, and rolling-over can be %simulated% using the LVDS. All these are made possible by using an advanced tire model capable of working over a wide regime of operating conditions including the most severe (normal loads up to 400% of standard, slip angles from -90 [degrees] to +900 [degrees] slip ratios from - 1 to 1, camber angles to 60 [degrees], and unlimited friction regime).

The tire forces and moments generated are nonlinear functions of normal load, longitudinal slip, slip angle, camber angle, and %tire% -roadway frictional %characteristics%. The %tire% model has the capability of predicting wheel locking, spinning, or saturating and automatically simulates the changes in %tire% behavior caused by these %conditions%.

The program is menu driven and fully interactive and allows the engineer to investigate the influence of vehicle or substructure design characteristics on performance, handling, stability, and rollover behavior. The LVDS simulation has been validated experimentally in both vehicle handling and rollover maneuvers and has been used for high-level research such as dynamic analysis of maneuver-induced rollover, stability of 4WS vehicles, sensitivity analysis of vehicle-design attributes that affect vehicle response in critical accident situations, effects of suspension design on light-vehicle stability, influence of vehicle design %characteristics% on %tire% forces generated, as well as for designing vehicle experimental tests.

Another software product developed by Vehicle Dynamics International, LVAS (Light Vehicle Animation Software), provides a method for presenting simulation results to management before designs are approved or to an audience with an interest in the subject matter but unacquainted with the technical details of engineering work or research.

The LVAS is a package of microcomputer programs developed to animate the vehicle response obtained from computer simulations such as the LVDS, or experimental tests. Any 3-D vehicle motion can be animated and played back in real time, or at slow motion, on color or monochrome monitors. The LVAS animation programs enable the engineer to assess quickly the overall response of all types of light vehicles, applicable environments, and maneuvers simulated. The animation of experimental results provides a visual re-creation of the actual tests from any viewpoint and allows individual correlation of experimental results.

The output from vehicle simulations usually takes the form of numeric data which are presented, using graphs, to show a time history of response variables. While these graphs provide the investigator with useful information about the behavior investigated, it may be difficult to use them for obtaining a clear understanding of the overall motion. By using the computer-based animation techniques in the LVAS, the evaluation of a complex response of the vehicle system can be achieved quickly and reliably. The software has proven to be extremely valuable in visualizing

couplings between vehicle motions in a variety of sub-limit and limit handling maneuvers including skidding and vehicle rollover.

Any good vehicle dynamics software should accurately simulate any vehicle maneuver without limitations, just as in real life. Depending on steering and/or braking inputs, the vehicle motion may be normal (controllable), or it may skid, spin out, or roll over. To achieve any of these, all important suspension effects (kinematics and dynamics) for a normal motion, vehicle skidding, spinning, and rolling over must be included in the overall vehicle model. The same applies to the tire-roadway effects and aerodynamics.

INDUSTRY CODES/NAMES: AUTO Automotive
DESCRIPTORS: Automotive drafting--Computer programs
SIC CODES: 7372 Prepackaged software
TRADE NAMES: Light Vehicle Dynamics Simulation (Computer graphics software)--Usage
FILE SEGMENT: TI File 148

10/9/5 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

07985818 SUPPLIER NUMBER: 17251406 (THIS IS THE FULL TEXT)
Spin control for cars.
Ashley, Steven
Mechanical Engineering-CIME, v117, n6, p66(3)
June, 1995
ISSN: 0025-6501 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 2564 LINE COUNT: 00210

ABSTRACT: Stability control systems are the latest in a string of technologies focusing on improved diriving safety. Such systems detect the initial phases of a skid and restore directional control in 40 milliseconds, seven times faster tthan the reaction time of the average human. They correct vehicle paths by adjusting engine torque or applying the left- or-right-side brakes, or both, as needed. The technology has already been applied to the Mercedes-Benz S600 coupe.

TEXT:

Automatic stability systems can detect the onset of a skid and bring a fishtailing vehicle back on course even before its driver can react.

Safety glass, seat belts, crumple zones, air bags, antilock brakes, traction control, and now stability control. The continuing progression of safety systems for cars has yielded yet another device designed to keep occupants from injury. Stability control systems help drivers recover from uncontrolled skids in curves, thus avoiding spinouts and accidents.

Using computers and an array of sensors, a stability control system detects the onset of a skid and restores directional control more quickly than a human driver can. Every microsecond, the system takes a "snapshot," calculating whether a car is going exactly in the direction it is being steered. If there is the slightest difference between where the driver is steering and where the vehicle is going, the system corrects its path in a split-second by adjusting engine torque and/or applying the cat's left- or right-side brakes as needed. Typical reaction time is 40 milliseconds - seven times faster than that of the average human.

A stability control system senses the driver's desired motion from the steering angle, the accelerator pedal position, and the brake pressure while determining the vehicle's actual motion from the yaw rate (vehicle rotation about its vertical axis) and lateral acceleration, explained Anton van Zanten, project leader of the Robert Bosch engineering team. Van Zanten's group and a team of engineers from Mercedes-Benz, led by project manager Armin Muller, developed the first fully effective stability control system, which regulates engine torque and wheel brake pressures using traction control components to minimize the difference between the desired and actual motion.

Automotive safety experts believe that stability control systems will reduce the number of accidents, or at least the severity of damage. Safety statistics say that most of the deadly accidents in which a single car spins out (accounting for four percent of all deadly collisions) could be avoided using the new technology. The additional cost of the new systems are on the order of the increasingly popular antilock brake/traction control units now available for cars.

The debut of stability control technology took place in Europe on the Mercedes-Benz S600 coupe this spring. Developed jointly during the past few years by Robert Bosch GmbH and Mercedes-Benz AG, both of Stuttgart, Germany, Vehicle Dynamics Control (VDC). in Bosch terminology, or the Electronic Stability Program (ESP), as Mercedes calls it, maintains vehicle stability in most driving situations. Bosch developed the system, and Mercedes-Benz integrated it into the vehicle. Mercedes engineers used the state-of-the-art Daimler-Benz virtual-reality driving simulator in Berlin to evaluate the system under extreme conditions, such as strong crosswinds. They then put the system through its paces on the slick ice of Lake

Hornavan near Arjeplog, Sweden. Work is currently under way to adapt the technology to buses and large trucks, to avoid jack-knifing, for example.

Stability control systems will first appear in mid-1995 on some European S-Class models and will reach the U.S. market during the 1996 model year (November 1995 introduction). It will be available as a $750 option on Mercedes models with V8 engines, and the following year it will be a $2400 option on six-cylinder cars. About $1650 of the latter price is for the traction control system, a prerequisite for stability control.

Bosch is not alone in developing such a safety system. ITT Automotive of Auburn Hills, Mich., introduced its Automotive Stability Management System (ASMS) in January at the 1995 North American International Auto Show in Detroit. "ASMS is a quantum leap in the evolution of antilock brake systems, combining the best attributes of ABS and traction control into a total vehicle dynamics management system," said Timothy D. Leuliette, ITT Automotive's president and chief executive officer.

"ASMS monitors what the vehicle controls indicate should be happening, compares that to what is actually happening, then works to compensate for the difference," said Johannes Graber, ASMS program manager at ITT Automotive Europe. ITT's system should begin appearing on vehicles worldwide near the end of the decade, according to Tom Mathues, director of engineering of Brake & Chassis Systems at ITT Automotive North America. Company engineers are now adapting the system to specific car models from six original equipment manufacturers.

A less-sophisticated and less-effective Bosch stability control system already appears on the 1995 750iL and 850Ci V-12 models from Munich-based BMW AG. The BMW Dynamic Stability Control (DSC) system uses the same wheel-speed sensors as traction control and standard anti-lock brake (ABS) systems to recognize conditions that can destabilize a vehicle in curves and corners. To detect such potentially dangerous cornering situations, DSC measures differences in rotational speed between the two front wheels. The DSC system also adds a sensor for steering angle, Utilizes an existing one for vehicle velocity, and introduces its own software control elements in the overall antilock-brake/traction-control/stability-control system.

The new Bosch and ITT Automotive stability control systems benefit from advanced technology developed for the aerospace industry. Just as in a supersonic fighter, the automotive stability control units use a sensor-based computer system to mediate between the human controller and the environment - in this case, the interface between tire and road. In addition, the system is built around a gyroscopelike sensor design used for missile guidance.

BEYOND ABS AND TRACTION CONTROL

Stability control is the logical extension of ABS and traction control, according to a Society of Automotive Engineers paper written by van Zanten and Bosch colleagues Rainer Erhardt and Georg Pfaff. Whereas ABS intervenes when wheel lock is imminent during braking, and traction control prevents wheel slippage when accelerating, stability control operates independently of the driver's actions even when the car is free-rolling. Depending on the particular driving situation, the system may activate an individual wheel brake or any combination of the four and adjust engine torque, stabilizing the car and severely reducing the danger of an uncontrolled skid. The new systems control the motion not only during full braking but also during partial braking, coasting, acceleration, and engine drag on the driven wheels, circumstances well beyond what ABS and traction control can handle.

The idea behind the three active safety systems is the same: One wheel locking or slipping significantly decreases directional stability or makes steering a vehicle more difficult. If a car must brake on a low-friction surface, locking its wheels should be avoided to maintain stability and steerability.

Whereas ABS and traction control prevent undesired longitudinal slip, stability control reduces loss of lateral stability. If the lateral forces of a moving vehicle are no longer adequate at one or more wheels, the vehicle may lose stability, particularly in curves. What the driver senses as "fishtailing" is primarily a turning or spinning around the vehicle's

axis. A separate sensor must recognize this spinning, because unlike ABS and traction control, a car's lateral movement cannot be calculated from its wheel speeds.

SPIN HANDLERS

The new systems measure any tendency toward understeer (when a car responds slowly to steering changes), or over-steer (when the rear wheels try to swing around). If a car understeers and swerves off course when driven in a curve, the stability control system will correct the error by braking the inner (with respect to the curve) rear wheel. This enables the driver, as in the case of ABS, to approach the locking limit of the road-tire interface without losing control of the vehicle. The stability control system may reduce the vehicle's drive momentum by throttling back the engine and/or by braking on individual wheels. Conversely, if the hteral stabilizing force on the rear axle is insufficient, the danger of oversteering may result in rear-end breakaway or spin-out. Here, the system acts as a stabilizer by applying the outer-front wheel brake.

The influence of side slip angle on maneuverability, the Bosch researchers explained, shows that the sensitivity of the yaw moment on the vehicle, with respect to changes in the steering angle, decreases rapidly as the slip angle of the vehicle increases. Once the slip angle grows beyond a certain limit, the driver has a much harder time recovering by steering. On dry surfaces, maneuverability is lost at slip-angle values larger than approximately 10 degrees, and on packed snow at approximately 4 degrees.

Most drivers have little experience recovering from skids. They aren't aware of the coefficient of friction between the tires and the road and have no idea of their vehicle's lateral stability margin. When the limit of adhesion is reached, the driver is usually caught by surprise and very often reacts in the wrong way, steering too much. Oversteering, ITT's Graber explained, causes the car to fishtail, throwing the vehicle even further out of control. ASMS sensors, he said, can quickly detect the beginning of a skid and momentarily activate the brakes at individual wheels to help return the vehicle to a stable line.

It is important that stability control systems be user-friendly at the %limit% of %adhesion% - that is, to act %predictably% in a way similar to normal driving.

The biggest advantage of stability control is its speed - it can respond immediately not only to skids but also to shifting vehicle conditions (such as changes in weight or %tire% %wear%) and road quality. Thus, the systems achieve optimum driving stability by changing the lateral stabilizing forces.

For a stability control system to recognize the difference between what the driver wants (desired course) and the actual movement of the vehicle (actual course), current cars require an efficient set of sensors and a greater computer capacity for processing information.

The Bosch VDC/ESP electronic control unit contains a conventional circuit board with two partly redundant microcontrollers using 48 kilobytes of ROM each. The 48-kB memory capacity is representative of the large amount of "intelligence" required to perform the design task, van Zanten said. ABS alone, he wrote in the SAE paper, would require one-quarter of this capacity, while ABS and traction control together require only one half of this software capacity.

In addition to ABS and traction control systems and related sensors, VDC/ESP uses sensors for yaw rate, lateral acceleration, steering angle, and braking pressure as well as information on whether the car is accelerating, freely rolling, or braking. It obtains the necessary information on the current load condition of the engine from the engine controller. The steering-wheel angle sensor is based on a set of LED and photodiodes mounted in the steering wheel. A silicon-micromachine pressure sensor indicates the master cylinder's braking pressure by measuring the brake fluid pressure in the brake circuit of the front wheels (and, therefore, the brake pressure induced by the driver).

Determining the actual course of the vehicle is a more complicated task. Wheel speed signals, which are provided for antilock brakes/traction

control by inductive wheel speed sensors, are required to derive longitudinal slip. For an exact analysis of possible movement, however, variables describing lateral motion are needed, so the system must be expanded with two additional sensors - yaw rate sensors and lateral acceleration sensors.

A lateral accelerometer monitors the forces occurring in curves. This analog sensor operates according to a damped spring-mass mechanism, by which a linear Hall generator transforms the spring displacement into an electrical signal. The sensor must be very sensitive, with an operating range of plus or minus 1.4 g.

YAW RATE GYRO

At the heart of the latest stability control system type is the yaw rate sensor, which is similar in function to a gyroscope. The sensor measures the speed at which the car rotates about its vertical axis. This measuring principle originated in the aviation industry and was further developed by Bosch for large-scale vehicle production. The existing gyro market offers two widely different categories of devices: $6000 units for aerospace and navigation systems (supplied by firms such as GEC Marconi Avionics Ltd., of Rochester, Kent, U.K.) and $160 units for videocameras. Bosch chose a vibrating cylinder design that provides the highest performance at the lowest cost, according to the SAE paper. A large investment was necessary to develop this sensor so that it could withstand the extreme environmental conditions of automotive use. At the same time, the cost for the yaw rate sensor had to be reduced so that it would be sufficiently affordable for vehicle use.

The yaw rate sensor has a complex internal structure centered around a small hollow steel cylinder that serves as the measuring element. The thin wall of the cylinder is excited with piezoelectric elements that vibrate at a frequency of 15 kilohertz. Four pairs of these piezo elements are arranged on the circumference of the cylinder, with paired elements positioned opposite each other. One of these pairs brings the open cylinder into resonance vibration by applying a sinusoidal voltage at its natural frequency to the transducers; another pair, which is displaced by 90 degrees, stabilizes the vibration. At both element pairs in between, so-called vibration nodes shift slightly depending on the rotation of the car about its vertical axis. If there is no yaw input, the vibration forms a standing wave. With a rate input, the positions of the nodes and antinodes move around the cylinder wall in the opposite direction to the direction of rotation (Coriolis acceleration). This slight shift serves as a measure for the yaw rate (angular velocity) of the car.

Stability controls can be disabled in situations in which some wheel slip and even lateral slip is beneficial, such as when a car is fitted with snow chains or is traversing loose gravel.

Several drivers who have had hands-on experience with the new systems in slippery cornering conditions speak of their cars being suddenly nudged back onto the right track just before it seems that their back ends might break away.

Some observers warn that stability controls might lure some drivers into overconfidence in low-friction driving situations, though they are in the minority. It may, however, be necessary to instruct drivers as to how to use the new capability properly. Recall that drivers had to learn not to "pump" antilock brake systems.

Although little detail has been reported regarding next-generation active safety systems for future cars (beyond various types of costly radar proximity scanners and other similar systems), it is clear that accident-avoidance is the theme for automotive safety engineers. "The most survivable accident is the one that never happens," said ITT's Graber. "Stability control technology dovetails nicely with the tremendous strides that have been made to the physical structure and overall capabilities of the automobile." The next such safety system is expected to do the same.

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Simulation of physically realistic complex dust behavior is very useful in training, education, art, advertising, and entertainment. There are no published models for real-time simulation of dust behavior generated by a traveling vehicle. In this paper, we use particle systems, computational fluid dynamics, and behavioral simulation techniques to simulate dust behavior in real time. First, we analyze the forces and factors that affect dust generation and the behavior after dust particles ar ...

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Frederick T. Sheldon, Stefan Grenier, Matthias Benzinger

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Keywords: computational fluid dynamics, particle systems, physically-based modeling, real-time simulation, vehicle

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Mark Roseman, Saul Greenberg

March 1996 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 3 Issue 1

Full text available: pdf(2.74 MB)

Additional Information: full citation, abstract, references, citings, index terms, review

This article presents an overview of GroupKit, a groupware toolkit that lets developers build applications for synchronous and distributed computer-based conferencing. GroupKit was constructed from our belief that programming groupware should be only slightly harder than building functionally similar single-user systems. We have been able to significantly reduce

the implementation complexity of groupware through the key features that comprise GroupKit. A runtime infrastructure
Keywords: GroupKit, computer-supported cooperative work, groupware toolkits, synchronous groupware, user interface toolkits

4 Assurance in life/nation critical endeavors: Biometrics or ... biohazards?
John Michael Williams
September 2002 **Proceedings of the 2002 workshop on New security paradigms**
Full text available: pdf(1.17 MB) Additional Information: full citation, abstract, references, index terms

IPSE DIXIT Biometrics as an array of deployable technologies presumes an elaborate infrastructure, including underlying science that justifies its claims of detection, classification, identification and authentication of individual human identities; particularly of those who are runaways, illegal immigrants, fugitives, criminals, terrorists, and so on.This will now too often be literally a matter of life and death, both for the public and the individuals identified.The "New Security Paradigm" em ...

5 Description of a high capacity fast turnaround university computing center
W. C. Lynch
January 1967 **Proceedings of the 1967 22nd national conference**
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The purpose of this paper is to describe the performance and operation of the UNIVAC 1107 computing system installed at the Andrew R. Jennings Computing Center at the Case Institute of Technology. The Center employs an open-shop type philosophy that appears to be unique among large scale installations. This philosophy leads to turnaround times which are better by an order of magnitude than those commonly being obtained with comparable scale equipment.

6 Multilevel thermal simulation of MCM's by system 'MONSTR-M'
V. A. Koval, D. V. Fedasyuk
March 1995 **Proceedings of the 1995 European conference on Design and Test**
Full text available: pdf(481.56 KB) Publisher Site Additional Information: full citation, abstract

In this paper, a method of simulation and analysis of MCM's thermal fields has been presented. The method is based on the MCM's structure decomposition and formalization of the problem of heat exchange simulation among the elements of a structure. The general thermal model of the structure is presented as multi-level rectangular parallelepiped with the flat and bulky heat sources with the assumption about heat exchange with the environment by the system of initial and boundary conditions. Steady ...

Keywords: MCM thermal design, MONSTR-M system, electronic engineering computing, heat exchange simulation, heat transfer, multichip modules, multilevel rectangular parallelepiped structure, multilevel thermal simulation, simulation, structure decomposition, thermal analysis, thermal fields, thermal model

7 SICCAPH 1 - Computers in the service of the handicapped - some issues and answers: Teaching speech to the deaf: can a computer help
R. S. Nickerson, K. N. Stevens
August 1972 **Proceedings of the ACM annual conference - Volume 1**
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1 **Development of locomotive wheels for improved adhesion and life**
Lonsdale, C.P.; Ishler, L.W.;
Railroad Conference, 2001. Proceedings of the 2001 IEEE/ASME Joint , 17-19 2001
Pages:29 - 34

[Abstract] [PDF Full-Text (612 KB)] **IEE JNL**

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2 **Vehicle supervision by bilinear parity equations**
Wurtenberger, M.; Hofling, T.;
American Control Conference, 1995. Proceedings of the , Volume: 3 , 21-23 J 1995
Pages:1662 - 1666 vol.3

[Abstract] [PDF Full-Text (508 KB)] **IEE JNL**

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1992. (INZZ) Study of Zn-Ni and Zn-Co alloy coatings electrodeposited on steel strips. I. Alloy

electrodeposition and **adhesion** of coatings to natural rubber compounds.

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1985. (INZZ) **Tire** cord surface analysis by glow discharge spectroscopy.

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1984. (INZZ) A note on the determination of Young's modulus of rubber compounds from the **tire** cord **adhesion** test.

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Accession number & update
6497480, B2000-03-8520-041, C2000-03-3360B-031; 20000201.

Title
Road condition estimation for traction control in electric vehicle.

Author(s)
Sado-H; Sakai-S; Hori-Y.

Author affiliation
Dept of Electr Eng, Tokyo Univ, Japan.

Source
Proceedings of ISIE '99. IEEE International Symposium on Industrial Electronics, vol.2, Bled, Slovenia, 12-16 July 1999.
Sponsors: IEEE Ind. Electron. Soc., Slovenia Minstr. Sci. & Technol., Soc. Instrum. & Control Eng. (Japan), Univ. Maribor, Univ. Ljubljana, IEEE Region 8, Slovenia Sect.
In: p.973-8 vol.2, 1999.

ISSN
ISBN: 0-7803-5662-4, CCCC: 0 7803 5662 4/99/ ($10.00).

Publication year
1999.

Language
EN.

Publication type
CPP Conference Paper.

Treatment codes
N New Development; P Practical; X Experimental.

Abstract
The target of our project is to realise a novel traction control system for an electric vehicle with four independently controlled in-wheel-motors. In each in-wheel-motor, the optimal slip ratio control is implemented beforehand to prevent wheel slip for vehicle stability control. The optimal slip ratio control is achieved by maintaining the slip ratio to the value to give the maximum road friction. This means that the driving force of the vehicle is fixed at its maximum level. As the driving force is affected by highly nonlinear **adhesion** characteristics between **tire** and road surface, real-time generation of the optimal slip ratio is necessary while the vehicle is moving. To estimate the **adhesion** characteristics, only the estimation of the slope of road friction curve is enough. To this aim, in this paper, the driving-force observer is newly designed to detect the road friction coefficient and the fixed-trace algorithm is applied to the slope estimation. The effectiveness of the proposed method is confirmed by simulation and experimental data obtained by laboratory-made electric vehicle "UOT Electric March". (7 refs).

Descriptors
adhesion; electric-vehicles; observers; parameter-estimation; traction; transport-control.

Keywords

traction control; electric vehicle; road condition estimation; independently controlled in wheel motors; optimal slip ratio control; wheel slip prevention; vehicle stability control; maximum road friction; driving force; highly nonlinear **adhesion** characteristics; road surface; **tire;** road friction curve estimation; driving force observer; road friction coefficient; fixed trace algorithm; slope estimation; UOT Electric March; laboratory made electric vehicle.

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B8520	(Transportation).
C3360B	(Road-traffic system control).
C1220	(Simulation, modelling and identification).

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TITLE: Environmentally friendly compositions having anti-icing, deicing or graffiti prevention properties

PUBLICATION-DATE: June 26, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Haslim, Leonard Arthur	Hayward	CA	US	

US-CL-CURRENT: 252/70; 106/13

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PGPUB-DOCUMENT-NUMBER: 20030050743
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DOCUMENT-IDENTIFIER: US 20030050743 A1

TITLE: Method and system for controlling the behaviour of a vehicle by controlling its tyres

PUBLICATION-DATE: March 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Caretta, Renato	Gallarate		IT	
Cesarini, Riccardo	Bergamo		IT	
Mancosu, Federico	Milano		IT	

US-CL-CURRENT: 701/1; 340/442

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PGPUB-DOCUMENT-NUMBER: 20030024727
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030024727 A1

TITLE: Systems and methods for modifying ice adhesion strength

PUBLICATION-DATE: February 6, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Petrenko, Victor F.	Hanover	NH	US	

US-CL-CURRENT: 174/110R

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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PGPUB-DOCUMENT-NUMBER: 20030024726
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DOCUMENT-IDENTIFIER: US 20030024726 A1

TITLE: SYSTEMS AND METHODS FOR MODIFYING ICE ADHESION STRENGTH

PUBLICATION-DATE: February 6, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
PETRENKO, VICTOR F.	HANOVER	NH	US	

US-CL-CURRENT: 174/110R

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☐ 5. Document ID: US 20020014114 A1

L4: Entry 5 of 16 File: PGPB Feb 7, 2002

PGPUB-DOCUMENT-NUMBER: 20020014114
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020014114 A1

TITLE: MODEL-BASED METHOD FOR DETERMINING THE ROAD HANDLING PERFORMANCE OF A TYRE OF A WHEEL FOR A VEHICLE

PUBLICATION-DATE: February 7, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
MANCOSU, FEDERICO	MILANO		IT	
SANGALLI, ROBERTO	BRUGHERIO		IT	

US-CL-CURRENT: 73/146

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. De

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☐ 6. Document ID: US 20010020386 A1

L4: Entry 6 of 16 File: PGPB Sep 13, 2001

PGPUB-DOCUMENT-NUMBER: 20010020386
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010020386 A1

TITLE: Tire having a model-based description enabling determination of road handling characteristics

PUBLICATION-DATE: September 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Mancosu, Federico	Milano		IT	
Sangalli, Roberto	Brugherio		IT	

US-CL-CURRENT: 73/146

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☐ 7. Document ID: US 6735630 B1

L4: Entry 7 of 16 File: USPT May 11, 2004

US-PAT-NO: 6735630
DOCUMENT-IDENTIFIER: US 6735630 B1

TITLE: Method for collecting data using compact internetworked wireless integrated network sensors (WINS)

DATE-ISSUED: May 11, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gelvin; David C.	Escondido	CA		
Girod; Lewis D.	Los Angeles	CA		
Kaiser; William J.	Los Angeles	CA		
Merrill; William M.	Los Angeles	CA		
Newberg; Fredric	San Diego	CA		
Pottie; Gregory J.	Los Angeles	CA		
Sipos; Anton I.	Los Angeles	CA		

NAME	CITY	STATE
Vardhan; Sandeep	Walnut	CA

US-CL-CURRENT: 709/224; 706/33, 709/200

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☐ 8. Document ID: US 6563053 B2

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US-PAT-NO: 6563053
DOCUMENT-IDENTIFIER: US 6563053 B2

TITLE: Systems and methods for modifying ice adhesion strength

DATE-ISSUED: May 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Petrenko; Victor F.	Hanover	NH		

US-CL-CURRENT: 174/110R; 244/134R

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D

☐ 9. Document ID: US 6223114 B1

L4: Entry 9 of 16 File: USPT Apr 24, 2001

US-PAT-NO: 6223114
DOCUMENT-IDENTIFIER: US 6223114 B1

TITLE: Process for controlling driving dynamics of a street vehicle

DATE-ISSUED: April 24, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Boros; Imre	Wolfschlugen			DE
Hamann; Dieter	Waiblingen			DE
Maurath; Rudolf	Esslingen			DE
Pressel; Joachim	Korntal-Muenchingen			DE
Reiner; Michael	Fellbach			DE

US-CL-CURRENT: 701/70; 701/1, 701/36, 701/41, 701/50, 701/53, 701/55, 701/72, 701/79

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D

☐ 10. Document ID: US 6129025 A

L4: Entry 10 of 16 File: USPT Oct 10, 2000

US-PAT-NO: 6129025
DOCUMENT-IDENTIFIER: US 6129025 A

TITLE: Traffic/transportation system

DATE-ISSUED: October 10, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Minakami; Hiroyuki	Kobe-shi, Hyogo 658			JP
Minakami; Motoyuki	Tsukuba-shi, Ibaraki 350			JP

US-CL-CURRENT: 104/88.01; 104/288, 104/292, 104/88.02

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 11. Document ID: US 6027075 A

L4: Entry 11 of 16 File: USPT Feb 22, 2000

US-PAT-NO: 6027075
DOCUMENT-IDENTIFIER: US 6027075 A

TITLE: Systems and methods for modifying ice adhesion strength

DATE-ISSUED: February 22, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Petrenko; Victor F.	Hanover	NH		

US-CL-CURRENT: 244/134R; 219/770, 244/134D

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 12. Document ID: US 5416709 A

L4: Entry 12 of 16 File: USPT May 16, 1995

US-PAT-NO: 5416709
DOCUMENT-IDENTIFIER: US 5416709 A
**** See image for Certificate of Correction ****

TITLE: Fuzzy controller for anti-skid brake systems

DATE-ISSUED: May 16, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yeh; Edge C.	Hsinchu			TW
Roan; G. K.	Tao-Yuan			TW
Ton; J. H.	Tao-Yuan			TW

US-CL-CURRENT: 701/77; 303/168, 701/70, 706/900

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 13. Document ID: US 5388658 A

L4: Entry 13 of 16 File: USPT Feb 14, 1995

US-PAT-NO: 5388658
DOCUMENT-IDENTIFIER: US 5388658 A
**** See image for Certificate of Correction ****

TITLE: Integrated torque and steering control system

DATE-ISSUED: February 14, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ando; Masao	Davis	CA		
Margolis; Donald L.	El-Macero	CA		

US-CL-CURRENT: 180/197; 180/246, 180/422, 180/65.1, 701/91

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 14. Document ID: US 4969212 A

L4: Entry 14 of 16 File: USPT Nov 6, 1990

US-PAT-NO: 4969212
DOCUMENT-IDENTIFIER: US 4969212 A

TITLE: Quantitative measurement of handling characteristics of tires and/or vehicle/tire combinations

DATE-ISSUED: November 6, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Walter; Steven L.	Akron	OH		

US-CL-CURRENT: 701/29; 702/182, 73/146

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 15. Document ID: US 4939985 A

L4: Entry 15 of 16 File: USPT Jul 10, 1990

US-PAT-NO: 4939985
DOCUMENT-IDENTIFIER: US 4939985 A

TITLE: Test bench for testing the drive train of a vehicle

DATE-ISSUED: July 10, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Von Thun; Hans-Jurgen	Hemsbach			DE

US-CL-CURRENT: 73/118.1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 16. Document ID: US 4916976 A

L4: Entry 16 of 16 File: USPT Apr 17, 1990

US-PAT-NO: 4916976
DOCUMENT-IDENTIFIER: US 4916976 A

TITLE: Infinitely continuously variable drive transmission

DATE-ISSUED: April 17, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Starr; John H.	Hustisford	WI	53034	

US-CL-CURRENT: 475/115; 475/186, 475/187, 475/191

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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Term	Documents
MOTION	521366
MOTIONS	57419
(3 AND MOTION).PGPB,USPT.	16
(L3 AND MOTION).PGPB,USPT.	16

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Search Results - Record(s) 1 through 6 of 6 returned.

☐ 1. Document ID: US 20030050743 A1

Using default format because multiple data bases are involved.

L5: Entry 1 of 6 File: PGPB Mar 13, 2003

PGPUB-DOCUMENT-NUMBER: 20030050743
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030050743 A1

TITLE: Method and system for controlling the behaviour of a vehicle by controlling its tyres

PUBLICATION-DATE: March 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Caretta, Renato	Gallarate		IT	
Cesarini, Riccardo	Bergamo		IT	
Mancosu, Federico	Milano		IT	

US-CL-CURRENT: 701/1; 340/442

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. D

☐ 2. Document ID: US 6735630 B1

L5: Entry 2 of 6 File: USPT May 11, 2004

US-PAT-NO: 6735630
DOCUMENT-IDENTIFIER: US 6735630 B1

TITLE: Method for collecting data using compact internetworked wireless integrated network sensors (WINS)

DATE-ISSUED: May 11, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gelvin; David C.	Escondido	CA		
Girod; Lewis D.	Los Angeles	CA		
Kaiser; William J.	Los Angeles	CA		
Merrill; William M.	Los Angeles	CA		
Newberg; Fredric	San Diego	CA		
Pottie; Gregory J.	Los Angeles	CA		

Sipos; Anton I.	Los Angeles	CA
Vardhan; Sandeep	Walnut	CA

US-CL-CURRENT: 709/224; 706/33, 709/200

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 3. Document ID: US 6223114 B1

L5: Entry 3 of 6 File: USPT Apr 24, 2001

US-PAT-NO: 6223114
DOCUMENT-IDENTIFIER: US 6223114 B1

TITLE: Process for controlling driving dynamics of a street vehicle

DATE-ISSUED: April 24, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Boros; Imre	Wolfschlugen			DE
Hamann; Dieter	Waiblingen			DE
Maurath; Rudolf	Esslingen			DE
Pressel; Joachim	Korntal-Muenchingen			DE
Reiner; Michael	Fellbach			DE

US-CL-CURRENT: 701/70; 701/1, 701/36, 701/41, 701/50, 701/53, 701/55, 701/72, 701/79

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 4. Document ID: US 6129025 A

L5: Entry 4 of 6 File: USPT Oct 10, 2000

US-PAT-NO: 6129025
DOCUMENT-IDENTIFIER: US 6129025 A

TITLE: Traffic/transportation system

DATE-ISSUED: October 10, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Minakami; Hiroyuki	Kobe-shi, Hyogo 658			JP
Minakami; Motoyuki	Tsukuba-shi, Ibaraki 350			JP

US-CL-CURRENT: 104/88.01; 104/288, 104/292, 104/88.02

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 5. Document ID: US 5416709 A

L5: Entry 5 of 6 File: USPT May 16, 1995

US-PAT-NO: 5416709
DOCUMENT-IDENTIFIER: US 5416709 A
**** See image for Certificate of Correction ****

TITLE: Fuzzy controller for anti-skid brake systems

DATE-ISSUED: May 16, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yeh; Edge C.	Hsinchu			TW
Roan; G. K.	Tao-Yuan			TW
Ton; J. H.	Tao-Yuan			TW

US-CL-CURRENT: 701/77; 303/168, 701/70, 706/900

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 6. Document ID: US 5388658 A

L5: Entry 6 of 6 File: USPT Feb 14, 1995

US-PAT-NO: 5388658
DOCUMENT-IDENTIFIER: US 5388658 A
**** See image for Certificate of Correction ****

TITLE: Integrated torque and steering control system

DATE-ISSUED: February 14, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ando; Masao	Davis	CA		
Margolis; Donald L.	El-Macero	CA		

US-CL-CURRENT: 180/197; 180/246, 180/422, 180/65.1, 701/91

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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Term	Documents
SENSOR?	0
SENSORA	9
SENSORB	2
SENSORD	2

SENSORE	31
SENSORF	2
SENSORG	1
SENSORI	34
SENSORJ	3
SENSORK	1
SENSORL	3
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Search Results - Record(s) 1 through 9 of 9 returned.

☐ 1. Document ID: US 20030077121 A1

Using default format because multiple data bases are involved.

L6: Entry 1 of 9 File: PGPB Apr 24, 2003

PGPUB-DOCUMENT-NUMBER: 20030077121
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030077121 A1

TITLE: HIGH-TRACTION ANTI-ICING ROADWAY COVER SYSTEM

PUBLICATION-DATE: April 24, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Chun, Joong H.	Plano	TX	US	

US-CL-CURRENT: 404/71

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. De

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☐ 2. Document ID: US 20030050743 A1

L6: Entry 2 of 9 File: PGPB Mar 13, 2003

PGPUB-DOCUMENT-NUMBER: 20030050743
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030050743 A1

TITLE: Method and system for controlling the behaviour of a vehicle by controlling its tyres

PUBLICATION-DATE: March 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Caretta, Renato	Gallarate		IT	
Cesarini, Riccardo	Bergamo		IT	
Mancosu, Federico	Milano		IT	

US-CL-CURRENT: 701/1; 340/442

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. De

☐ 3. Document ID: US 6735630 B1

L6: Entry 3 of 9 File: USPT May 11, 2004

US-PAT-NO: 6735630
DOCUMENT-IDENTIFIER: US 6735630 B1

TITLE: Method for collecting data using compact internetworked wireless integrated network sensors (WINS)

DATE-ISSUED: May 11, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gelvin; David C.	Escondido	CA		
Girod; Lewis D.	Los Angeles	CA		
Kaiser; William J.	Los Angeles	CA		
Merrill; William M.	Los Angeles	CA		
Newberg; Fredric	San Diego	CA		
Pottie; Gregory J.	Los Angeles	CA		
Sipos; Anton I.	Los Angeles	CA		
Vardhan; Sandeep	Walnut	CA		

US-CL-CURRENT: 709/224; 706/33, 709/200

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De

☐ 4. Document ID: US 6592288 B2

L6: Entry 4 of 9 File: USPT Jul 15, 2003

US-PAT-NO: 6592288
DOCUMENT-IDENTIFIER: US 6592288 B2

TITLE: High-traction anti-icing roadway cover system

DATE-ISSUED: July 15, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chun; Joong H.	Plano	TX	75023	

US-CL-CURRENT: 404/71; 238/14, 404/19, 404/31, 404/36

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De

☐ 5. Document ID: US 6223114 B1

L6: Entry 5 of 9 File: USPT Apr 24, 2001

US-PAT-NO: 6223114
DOCUMENT-IDENTIFIER: US 6223114 B1

TITLE: Process for controlling driving dynamics of a street vehicle

DATE-ISSUED: April 24, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Boros; Imre	Wolfschlugen			DE
Hamann; Dieter	Waiblingen			DE
Maurath; Rudolf	Esslingen			DE
Pressel; Joachim	Korntal-Muenchingen			DE
Reiner; Michael	Fellbach			DE

US-CL-CURRENT: 701/70; 701/1, 701/36, 701/41, 701/50, 701/53, 701/55, 701/72, 701/79

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 6. Document ID: US 6129025 A

L6: Entry 6 of 9 File: USPT Oct 10, 2000

US-PAT-NO: 6129025
DOCUMENT-IDENTIFIER: US 6129025 A

TITLE: Traffic/transportation system

DATE-ISSUED: October 10, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Minakami; Hiroyuki	Kobe-shi, Hyogo 658			JP
Minakami; Motoyuki	Tsukuba-shi, Ibaraki 350			JP

US-CL-CURRENT: 104/88.01; 104/288, 104/292, 104/88.02

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 7. Document ID: US 5487301 A

L6: Entry 7 of 9 File: USPT Jan 30, 1996

US-PAT-NO: 5487301
DOCUMENT-IDENTIFIER: US 5487301 A

TITLE: Test rig and process for testing motor vehicle assemblies, in particular independent wheel suspension

DATE-ISSUED: January 30, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Muller; Andreas	Darmstadt			DE

Grubisic; Vatroslav	Reinheim	DE
Fischer; Gerhard	Darmstadt	DE

US-CL-CURRENT: 73/118.1; 73/798

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 8. Document ID: US 5416709 A

L6: Entry 8 of 9 File: USPT May 16, 1995

US-PAT-NO: 5416709
DOCUMENT-IDENTIFIER: US 5416709 A
**** See image for Certificate of Correction ****

TITLE: Fuzzy controller for anti-skid brake systems

DATE-ISSUED: May 16, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yeh; Edge C.	Hsinchu			TW
Roan; G. K.	Tao-Yuan			TW
Ton; J. H.	Tao-Yuan			TW

US-CL-CURRENT: 701/77; 303/168, 701/70, 706/900

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 9. Document ID: US 5388658 A

L6: Entry 9 of 9 File: USPT Feb 14, 1995

US-PAT-NO: 5388658
DOCUMENT-IDENTIFIER: US 5388658 A
**** See image for Certificate of Correction ****

TITLE: Integrated torque and steering control system

DATE-ISSUED: February 14, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ando; Masao	Davis	CA		
Margolis; Donald L.	El-Macero	CA		

US-CL-CURRENT: 180/197; 180/246, 180/422, 180/65.1, 701/91

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Term	Documents
SENSOR?	0
SENSORA	9
SENSORB	2
SENSORD	2
SENSORE	31
SENSORF	2
SENSORG	1
SENSORI	34
SENSORJ	3
SENSORK	1
SENSORL	3
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